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Experiments in Ethics?

Kant on Chemistry and Practical Philosophy

I discuss two puzzling and neglected passages in the *Critique of Practical Reason*, namely, V:92 and V:163. In these passages Kant claims that practical philosophers should follow the paradigm of the chemist and conduct experiments on common human reason. I explain Kant's conception of the chemical experiment, provide a detailed interpretation of the two passages in question, and conclude by applying the structure of the chemical experiment to the *Analytic* of the *Critique of Practical Reason*. Chemical experiments as a model of ethics should be understood as a method of confirming that a philosophical theory systematizes and defends ideas that ordinary rational agents are already committed to.

In two passages of the Second Critique, Kant recommends chemical experiments as a paradigm for practical philosophy. Owen Ware recently remarked that this recommendation is “at once odd and intriguing”.¹ The significance of the two passages for Kant’s practical philosophy is frequently overlooked in the Kant literature², presumably since it is *prima facie* difficult to understand why Kant thinks that the ethicist can learn anything for her enterprise from the chemist. After all, chemical science is empirical and descriptive, whereas practical philosophy is supposed to be a priori and normative. There has, however, recently been a surge of interest in the question of how the sciences influence Kant’s ethics³, as well as in the role of our ordinary, pre-philosophical conception of morality – the object which the chemical method in ethics is supposed to scrutinize.⁴ This makes Kant’s odd and intriguing recommendation worth a closer look.

In this paper, I will discuss the fruitfulness but also the limits of the experiment as a method for Kant. The contribution of my paper to Kant scholarship is to show how Kant in the Second Critique stresses that his philosophy has moral convictions and important experiences of the non-philosopher on its side, and how thought experiments can confirm elements of Kant’s theory. Kant believes that his philosophy is different from theoretically sophisticated, yet “alien and irrelevant considerations” (IV:404.27-8)⁵, and “perplexing speculations of the schools” (V:35.16-18), which can deflect ordinary judgements from the straight course.

Unlike these other approaches to morality, it is possible to link the results of his practical philosophy back to a conception of the good that precedes all academic sophistication. Kant advocates experiments as a method of inquiry into “every human being’s practical reason” (V:92.28-9), “reason judging morally” (ibid.163.16), and “common human understanding” (ibid.20). Experiments are supposed to facilitate this enquiry by creating a context in which underlying structures of ordinary reasoning are revealed clearly and in isolation of

obstructing factors. The chemical method is an element that Kant believes is distinctive of his approach and sets his philosophy apart from those of his colleagues.

Both chemistry passages deserve to be quoted in full here:

P1: “[The philosopher] has, however, the advantage that, almost like a chemist, he can at any time set up an experiment with every human being’s practical reason in order to distinguish the moral (pure) determining ground from the empirical affected will (e.g., that of someone who would gladly lie because he can gain something by it). When an analyst adds alkali to a solution of calcareous earth in hydrochloric acid, the hydrochloric acid at once releases the lime and unites with the alkali, and the lime is precipitated. In just the same way, if a man who is otherwise honest (or who just this once puts himself only in thought in the place of an honest man) is confronted with the moral law in which he cognizes the worthlessness of a liar, his practical reason (in its judgement of what we ought to do) at once abandons the advantage, unites with what maintains in him respect for his own person (truthfulness), and the advantage, after it has been separated and washed from every particle of reason (which is entirely on the side of duty), is weighed by everyone, so that it can enter into combination with reason in other cases, only not where it could be opposed to the moral law, which reason never abandons but unites with most intimately.” (V:92.27-93.10)

P2: “We have at hand examples of reason judging morally. We can analyse them into their elementary concepts and, in default of mathematics, adopt a procedure similar to that of chemistry – the decomposition, by repeated experiments on common human understanding, of the empirical from the rational that might be found in them – and come to know both of them pure and what each can accomplish of itself; and in this way we can prevent on the one hand the errors of a still *crude*, unpracticed appraisal and on the other hand (what is far more necessary) the *leaps of genius* by which, as happens with the adepts of the philosopher’s stone, without any methodological study or knowledge of nature’s visionary treasures are promised and true ones are thrown away.” (V:163.15-26)⁶

Kant’s proposal to think of chemical experiments as a paradigm for ethics raises, at least, four questions, with which I will deal in this paper. Firstly, what is it about chemical experiments that Kant deems characteristic of this method and that should inspire the ethicist? The first section of my paper will therefore explain Kant’s conception of the chemical experiment.

Secondly, how does the chemical experiment translate to ethics? In the second section, I will show how Kant's idealized example of an experiment in P1 is supposed to reveal the nature of the relation between the will of finite rational beings, happiness and rational incentives. Thirdly, what is the function of experiments for Kant's ethics? P1 leaves open the status of the experiment. It is not clear whether Kant takes experiments to be a method of practical philosophy, or a means of moral education. In the third section, I will show that P2 reveals that experiments are intended by Kant as a method of confirming elements of his practical philosophy. Nonetheless, they have an indirect function for education insofar as practical philosophy must be the basis of moral education, and insofar as experiments can also be used to demonstrate or illustrate.⁷ Fourthly, how does the experiment advance our understanding of Kant's engagement with common human reason? In the final section of my paper, I will apply the experimental framework to the *Analytic* of the Second Critique, the part of Kant's work in which the chemical method is most prevalent. Setting up and analyzing thought experiments is supposed to provide a *confirmation* that Kant's philosophical enquiry has our ordinary understanding of morality on its side.

1. Kant's conception of chemical experiments

The aim of this section is to provide an overview of how a chemical experiment, according to Kant, proceeds. I will not offer a new interpretation of Kant's conception of chemistry but merely highlight elements that are recognized in the existing literature but not understood in its relevance for Kant's *practical* philosophy. My investigation in this section will enable us in the next section to properly understand Kant's dense discussion of a thought experiment modelled on a chemical paradigm, and to understand the role of what I will call "laws of practical affinity".

That Kant, of all possible sciences, draws on *chemistry* is hardly surprising given the intellectual *Zeitgeist* of the late 18th century. Much could be said here about the influence of chemistry on the intellectual life of Enlightenment, Romanticism and Classical German Philosophy.⁸ However, in what follows, I will focus my investigation on the role of the experiment for Kant's practical philosophy.

Kant was "deeply engaged with the science of his time"⁹, and we can assume that he was familiar with state of the art chemistry.¹⁰ Chemistry, for Kant, is distinguished from a priori science by its laws which are "merely laws of experience" [Erfahrungsgesetze] (IV:468.25, see also XX:259.4-10). Chemistry is a posteriori (IV:469.11, XXIX:97.12-17), and, at bottom, "arbitrary" (IV:469.10). In his late *Metaphysics of Morals*, Kant, however, indicates that chemistry is a rational science (VI:207.7-14). Finally, In his *Opus Postumum*, Kant states that chemistry is part of physics (XXI:288.5-6, 316.20-22), which has a priori foundations (XXI:527.18-528.18). I will, in this paper, focus on Kant's conception of chemistry at the time of writing the Second Critique.¹¹ In the 1780th, Kant stresses repeatedly that a priori laws for chemistry cannot be found (IV:471.4-5), and that chemistry is thus a "systematic art or doctrine of experiments" [Experimentallehre] (IV:471.5-6, see also IV:468.29). Experiments are a form of enquiry particularly suited to chemistry. An a priori science such as physics, by contrast, though it admits of experiments (see for instance B:xii-xiii), does not need experiments to establish its most general principles (B:xix.fn.). These principles can be established *a priori*. Chemistry, Kant believes, lacks an a priori part, its first principles lack necessity and they are based on experience (IV:468.17-29). Chemical experiments are a method of a posteriori investigation and the only means to warrant chemical principles. According to Kant, a chemist is both a "Scheide Künstler" and a "Mengmeister" (XXIX:117.24-5), i.e., an artist of separation [Scheide Künstler] and an expert of combination or blending [Mengmeister]. This has a rationale in the nature of chemical forces

themselves, since they include repulsion or decomposition [Scheiden] and attraction or composition [Zusammensetzen] (XXIX:117.18). A chemical experiment, for Kant, consists of the decomposing of a substance, keeping the components of the substance in isolation, and then recombining components with another substance.¹² We will now look at this process in more detail:

Step 1 Decomposition: According to the *Metaphysical Principles of Natural Science*, chemistry uses “forces of repulsion and attraction” (ibid.26) as its basic explanatory terms.¹³ In a chemical “*decomposition*” [Scheidung] (IV:530.17) two substances composing a solution are “separated” (IV:530.16) from each other. A decomposition can be initiated when the chemist adds another, third, substance to a solution of two substances. This reaction breaks the solution into its components.¹⁴ In the next section, we will see that P1 describes such a decomposition of two substances initiated by a third substance. “Decomposition” is what philosophers would call an “analysis”: a process of breaking a larger whole into its (basic) parts in order to gain understanding of the whole by investigation of its components in isolation of each other.

Step 2 Recombination: The second step consists of two sub-steps. The first is to keep the decomposed components in isolation and to “carefully avoid mixing them together with others with which they are usually connected in their use” (A/B:842/870). This is done in order to be able to “securely determine” (A/B:842/870) the specific influence and contribution of each part to the whole. The second sub-step is discussed in a footnote in the First Critique (B:XXI). Chemistry and metaphysics share a procedure which Kant calls “synthetic” (ibid.). He illustrates this procedure as follows: When the metaphysician has decomposed pure cognition into its elements, appearances and things in themselves,

“*dialectic* once again combines them, in *unison* with the necessary rational idea of the *unconditioned*, and finds that the unison will never come about except through that distinction” (ibid.). The metaphysician who practices dialectic not only recombines the elements of pure cognition after their decomposition, but also introduces a third element (the idea of the unconditioned). This is done with the intention of gaining new metaphysical insight, pertaining to the ultimate (unconditional) structure of reality. It is one of Kant’s aims in the First Critique to warn that such a method, if the unconditioned is not treated as a merely regulative principle, can give rise to illusions and misconceptions.¹⁵ While Kant is critical of the method of the (dogmatic) metaphysician he seems to think that the recombination with a third substance is a legitimate method for chemistry: The chemist observes the components reacting in specific ways with other components, and thus gains knowledge about the components’ affinities or their behaviour with other components.

The reason why Kant thinks that chemists can gain knowledge by recombination is that components do not combine arbitrarily, but according to their *affinities*. Affinities are elective attractions of substances and determine the outcome of chemical reactions. In the *Anthropology* an affinity is characterised as the

“interaction of two specifically different, physical substances, which intimately act upon each other and strive for unity, and this unification effects something third that has properties, which can only be produced by the unification of two heterogeneous substances” (VII:177.20-4).

The theory of affinities dates back to Newton who postulated short-range forces of attraction and repulsion for a microscopic level in analogy to the force of gravity. Whereas gravity is determined only by the *mass* of substances, the short-range forces are also sensitive to the *quality* of substances, in the sense that certain substances have *affinities* to certain other

substances.¹⁶ In the mid and late 18th century chemists devised tables of affinities: Listings of the affinities of a substance to other substances under different conditions, such as temperature, and the various medium substances of the chemical reaction.¹⁷ The existence of affinities revealed that the combination of even the smallest components of nature is governed by laws.¹⁸ Studying elective affinities meant employing the *experimental method* of decomposing a substance, keeping its components isolated, and observing their recombination with other components according to laws of nature.¹⁹

2. Conducting experiments with everyone's practical reason

We will now put Kant's framework of decomposition and recombination to work in order to understand P1, and to investigate what Kant's proposed experiment, as well as the differences between ethical and chemical experiments reveal about reasoning in particular cases. This will help us understand in the last section of the paper how Kant in the Second Critique's *Analytic* uses thought experiments to confirm his distinction between two different determining grounds of the will (see section 4.1), and the practical affinities of this will, or the unconditional normative status of practical laws (see section 4.2). We will discuss P1 in two steps. We will first discuss the decomposition and recombination (2.1) and then what it means that an agent is confronted with the moral law (2.2).

2.1 Decomposition and Recombination

We can see the chemical process of decomposition and recombination at work in P1: "an analyst [Scheidekünstler] adds alkali to a solution of calcareous earth in hydrochloric acid, the hydrochloric acid at once releases the lime and unites with the alkali, and the lime is precipitated" (V:92.33-5). Philosophers can apply the experimental method "[i]n just the same way" [Ebenso] (V:92.35) in philosophy. "In just the same way" means that there are

structural similarities between the doings of the chemist and the philosopher. It certainly does not mean that chemist and practical philosopher are dealing with the same objects or operate with the same notion and standard of evidence. After all, Kant stresses that the philosopher is only supposed to set up experiments “almost” [beinah] (V:92.27) like a chemist, not follow a chemical method literally.

The philosophical experiment is meant to facilitate an investigation of different elements involved in rational deliberation by distinguishing “the moral (pure) determining ground from the empirical affected will” (V:92.29-31). The analogue of the hydrochloric acid, the substance that in the chemical experiment releases a substance and unites with another substance, is practical reason, or the will of the “honest man (or who just this once puts himself only in thought in the place of an honest man)” (V:92.36-7). Both hydrochlorid acid and the honest man’s will begin the experiment in a solution with another substance. The will is, at the beginning of the experiment, “empirically affected” (V:92.30-1), that is to say, affected with the desire to lie. The honest man is the agent who, in principle, recognises the moral law and is capable of abstracting from empirical determining grounds in his judgements, but is also incentivised to violate moral commands. In the philosophical experiment, the solution of will and empirical determining ground, a solution that can be called “an empirically determined or impure will”, is “confronted with the moral law” (V:92.37-93.1). The moral law is a pure determining ground and analogous to the alkali. In the chemical experiment the alkali is added by the chemist, in the philosophical experiment the philosopher confronts the honest man with the moral law. The honest man’s will abandons empirical determining grounds, both components of the solution are being separated from each other (decomposition), and the will “unites with what maintains in [the honest man] respect for his own person” (V:93.3-4), i.e., with pure determining grounds

(recombination) – a change that is structurally equivalent to the one the hydrochloric acid undergoes.

A note about translation is in order to properly understand the analogy. The way Gregor translates the analogue of the empirical determining ground, “Kalkerde” as “calcareous earth” and “Kalk” as “lime”, unfortunately makes P1 unnecessarily difficult to understand.²⁰

Gregor’s “calcareous earth” and “lime” suggest that four substances (hydrochloric acid, alkali, calcareous earth, and lime) are involved in P1. In the previous section I, however, argued that the best way to understand Kant’s notion of a chemical experiment is that a third substance is added to a solution of two other substances and this third substance initiates a decomposition and recombination. It is not clear what a separate fourth substance would do in this process. In addition, the German suggests that calcareous earth (Kalkerde) and lime (Kalk) are not different substances. Both are “Kalk”. The one, calcareous earth (Kalkerde), is lime in a solution with another substance, namely hydrochloric acid, the other, lime (Kalk), is the product of a chemical reaction that separates lime from the hydrochloric acid.²¹ It is clearer in the German than in the English translation that P1 works on a model devised for three substances (hydrochloric acid, alkali, Kalk).

When confronted with moral commands, reason “abandons” (V:93.2) empirical determining grounds, and empirical determining grounds are separated of “every particle of reason” (V:93.5). That empirical determining grounds are separated from reason as the result of a process indicates that prior to this separation they had reason on their side, or that satisfying one’s sensuous needs and inclinations can be rational, as long as it is morally permissible. Otherwise no separation would be required. After the separation, however, acting on empirical determining grounds is no longer rational, since reason is “now entirely on the side of duty” (V:93.6). It might still be prudent but there is nothing that can rationally be said for it.

A note about edition is in order here. Jens Timmermann and Valerio Rohden propose to emend the Academy Edition's "nur gänzlich auf Seite der Pflicht ist" (V:93.6).²² They suggest reading the "nur" (only) as "nun" (now). The former would mean that duty is the *only* ("nur") rational option, and pursuit of happiness is never rational, whereas the latter expresses the much more moderate claim that in a morally relevant situation duty is *now* ("nun") the only rational option.²³ I agree with this emendation. It would be very odd for Kant to completely dismiss that pursuing happiness can be rational. After all, the experiment explicitly started with reason being in a solution with empirical incentives.

Whilst Kant's conception of happiness is not the main focus of this paper, it is one of the interesting aspects of his discussion of chemistry that Kant here discusses the rationality of the pursuit of personal happiness. On the most plausible reading of P1 pursuing personal happiness is the default starting position of rational deliberation and rational to do, unless morality issues a veto and then (but only then) all rationality is on the side of this veto. The empirical option that is now without reason, however, might still be appealing to an agent's sensuous side and can even move this agent to act against rational commands. We will see below (sec.4.2) that Kant's prime example of a thought experiment explicitly accommodates irrationality or the fact that there is an important difference between judging correctly in an idealized and hypothetical scenario and actions in the real world. Rational affinities do not necessarily lead to *de facto* prioritization of morality. The gallows case will show how agents can react to the obstruction of the messiness of real life cases, and how the affinities of their will shine through in their judgements.

2.2 Confronting an Agent with the Moral Law

What does it mean that in the experiment an empirically affected will abandons empirical determining grounds once an agent is "confronted with the moral law"? On the most

straightforward reading “confronted” simply means that the agent becomes aware of a moral prohibition – either as a result of critical reflection on her intended action or because someone else, in the example the chemist, points out that her action requires moral scrutiny and what the morally questionable aspects of the action are. In some cases, however, simply reflecting on one’s intended action or a reminder by other people of what duty commands might not be sufficient to change one’s mind. Being confronted with the moral law can presumably also occur as the result of a longer lasting dialogue in which the intentions or goals of an agent are critically scrutinized, their moral implications explained to the agent and in which the agent is presented with exemplary cases in order to trigger the right intuitions.²⁴ This interpretation of what it means to be confronted with the moral law resonates well with the notion that an experiment is, unlike a mere observation, an artificial scenario that is created and controlled by the scientist in order to necessitate nature to answer our questions (see B:XIII, A/B:645-6/673-4). The scientist plays an active role in setting up a specific experiment, just as the ethicist is active when trying to bring an agent to understand certain moral propositions, or morally relevant features that must be taken into account.²⁵ The experiment rests on the assumption that once moral commands are sufficiently clear or made clear to an agent, they will have an effect on his appraisal of morally relevant situations, even when this agent is empirically affected.²⁶ This interpretation of the experiment for ethics accords well with the phenomenon that it is not always clear for agents what they ought to do, and that agents sometimes need other agents to remind them to reflect on their actions and to set them right. In this sense Kant’s philosophical operation is disanalogous to the chemical experiment in the neat way it is described in P1. A chemical analogue to confronting a stubborn agent with the moral law would rather be an experiment in which the chemist is unsure of how to decompose a substance, and in which he has to try

out various instruments, tools and strategies in his “fight” with the recalcitrant substance, until he finally discovers how to decompose it.

The question of how to interpret the “confronted with the moral law” also reveals a more important difference between the chemical experiment and its analogue in practical philosophy: Moral considerations are not *consciously* present within every deliberation of an agent and to facilitate the ethical experiment an agent’s awareness is drawn to morally salient features. Even if explicit moral considerations are introduced by another agent who draws attention to the morally relevant features of an action, they are never added to the solution of will and empirical determining grounds as a chemical substance is added to a solution. For Kant, moral constraints are always part of a rational agent’s will. While the chemist adds an entirely new substance that was previously not contained within a solution, the philosophical experimenter only has to bring to an agent’s attention something that is always, implicitly, present in her will (though not always active in the sense that it determines the will). In so far as no *external* substance is added to the solution, the chemical method fails to capture Kant’s conception of deliberation in morally relevant scenarios. Marginalizing this difference would suggest that the moral law is external and heteronomous.²⁷

I *summarize*: The philosophical experiment in P1 contains a dense illustration of Kant’s conception of finite agents’ moral deliberation. The experiment captures well Kant’s trichotomy between will, pure and empirical determining grounds, as well as the stronger affinities between will and pure determining grounds. Furthermore, it shows that Kant thinks of the one who conducts the experiment as active, or as creating concrete fictional scenarios. The main difference between experiments in chemistry and ethics is that in ethics the experimenter needs to raise attention to something that is already there, whereas in chemistry something entirely new is added. In chemistry and philosophy experiments are highly

artificial and controlled situations explicitly created to isolate the structure under investigation from interfering factors. How can such an artificial scenario reveal anything about real life deliberation and the empirical context in which it starts, though? We will find an answer to this when we look at the gallows case, Kant's prime example of an ethical experiment (sec.4.2). Before that we must turn to the question of what the general purpose of the experiment is, or what activity it is exactly supposed to facilitate.

3. Means of Education or Method of Philosophy?

Experiments in the sciences are supposed to confirm elements of scientific theories. Their goal is to gain knowledge. Matters are not as clear cut in ethics, since for Kant the purpose of ethics, besides gaining knowledge about morality, is to morally improve agents. This is reflected in an important ambivalence in the description of the experiment in P1. It is not clear who or what the analogue of the *chemist* is. Does Kant recommend the method of chemistry as a means of *education*, i.e., in order to improve agents according to the teachings of a philosophical doctrine, or as a method of *practical philosophy* for establishing the doctrine in the first place?

It is noteworthy that Kant, at the end of P1, uses the language of *purification*. Empirical incentives are “washed from every particle of reason” (V:93.6) or the will is purged and cleansed by reason from empirical determining grounds. This suggests that the ethical experiment is supposed to facilitate the cleansing of the will from impurities, and that it serves the purpose of improving a person's moral disposition. Furthermore, though Kant mentions the philosopher only a few lines before he introduces the experiment (V:92.24), when he specifies what the analogue of the chemist is supposed to do, he uses an *imperative construction*, which can be best translated as: “At the same time confront him, who is otherwise an honest man [...], with the moral law” (V:92.35-93.1).²⁸ Using an imperative in

an academic work is unusual, and if Kant thought that it was the philosopher who was supposed to conduct the experiment, a simple “he” instead of an imperative would have been a more natural way of referring to the philosopher.²⁹ Instead, Kant’s imperative addresses the *reader*. The reader of the Second Critique might be an academic philosopher, but she might also be someone who reads this book in order to learn about the guidelines and means of moral education. After all, these means are discussed in the Second Critique’s *Doctrine of Method*.³⁰

According to Kant, the ethicist sets up guidelines and foundations for education, but does not herself improve people’s dispositions. Popularizing philosophy and improving the general public based on philosophical doctrine is the role of popular philosophers, as well as teachers and private tutors, “popular instruction for children” (VI:14.8-10) and of religious authorities, religious instruction and preaching (VIII:403.5-10).³¹ P2 makes clear that, even though experiments affect moral education, they do so insofar as they are a philosophical method. According to P2, experiments are supposed to

“prevent on the one hand the errors of a still *crude*, unpractised appraisal and on the other hand (what is far more necessary) the *leaps of genius* by which, as happens with the adepts of the philosopher’s stone, without any methodical study or knowledge of nature visionary treasures are promised and true ones are thrown away” (V:163.22-6).

How can experiments prevent error and the leaps of supposed geniuses? Experiments help to establish a “*doctrine of wisdom*” (V:163.28), and this doctrine is supposed to “serve *teachers* as a guideline to prepare well and clearly the path to wisdom which everyone should travel, and to secure others against taking the wrong way” (V:163.29-31). Experiments are not supposed to educate directly, but to *inform* the educator, and thereby to indirectly improve education. They are a method of practical philosophy “and though the public need take no interest in [practical philosophy’s] subtle investigations it has to take an interest in the

doctrines which, after being worked up in this way, can first be quite clear to it” (V:163.33-5).

According to Kant, any education has to rest on principles; and a moral education must rest on moral principles.³² Practical philosophy has to find these principles and thus to determine the guidelines of moral education. In its function as a foundation of moral education practical philosophy can indirectly influence an agent's “receptivity to a pure moral interest” (V:152.33-4), i.e., his capacity to take an interest in morality and to act on it, regardless of other considerations, and it can assist the “founding and cultivating of genuine moral dispositions” (V:153.11). The ethicist finds or determines the guidelines of moral education. That is to say, he clarifies and systematizes the common agent's tacit conception of morality and provides a philosophical justification for it. The educator is informed by these guidelines. The guidelines offer principles and a rational foundation for moral education. Ethical experiments indirectly influence moral education and the improvement of an agent's disposition, insofar as they confirm the philosophical guidelines of moral education; in particular, as we will see, they confirm that Kant's conceptual distinction between determining grounds resonates in ordinary deliberation (see sec.4.1), and that the authority of morality is not alien to common agents (see sec.4.2).

The idea that the philosophical experiment primarily serves to obtain knowledge or to confirm scientific claims but can also have an educational function can be found in chemistry as well. While experiments in the natural sciences are primarily supposed to facilitate scientific research, some might also be used to illustrate a theory or to awaken curiosity. Certain philosophical thought experiments may be used as an illustration and to train the agent to clearly separate components of her thought so that she more clearly sees what duty demands (see for instance V:155.12-157.6, VI:480.15-483.8). The training or educational value of experiments, both in practical philosophy and chemistry, comes second to their value

in discovering truth, though.

That thought experiments for Kant are primarily concerned with philosophical truth not with an educational function becomes clear when paying attention to the location of the chemical passages in the Second Critique. P1 is located in a section called “*Critical Elucidation of the Analytic of Pure Practical Reason*”. This section is an “investigation and justification”

(V:89.12-3) of why the preceding *Analytic of Pure Practical Reason* has the form it has, or it is a reflection on method. P2 is located in the very last paragraph of the Second Critique. This paragraph offers an overall summary of the Second Critique’s project. The location of both passages suggests that the chemical method plays an important role in the philosophical argument advanced in the Second Critique. P1 as part of a methodological reflection on the *Analytic* suggests that this role is particularly to be found in the *Analytic*, to which we will now turn.³³

4. Experiments in the Second Critique’s *Analytic*

We will now discuss what the experiment specifically contributes to Kant’s philosophy by looking at the part of his practical philosophy that exhibits the experimental method at work most clearly: The Second Critique’s *Analytic of Pure Practical Reason*.

Common human reason or common human understanding plays an important role as a point of reference for Kant’s enquiry throughout the *Analytic*. The commonest understanding can “see quite easily and without hesitation” (V:36.29) what is morally required in a specific situation (see also V:27.21-2), and Kant’s philosophical remarks are only supposed to “afford the judgement of common human reason somewhat greater distinctness” (V:36.7-8). The *Analytic* can be understood as an inquiry into the presuppositions and principles that enable a common, philosophically untutored rational agent to judge something as morally good or bad and to be motivated by these judgements. Kant’s goal in the Second Critique, much like his

goal in the *Groundwork*, is to elaborate on insights revealed in ordinary judgements about matters of moral significance, to systematize these insights, and to defend them against corrupting moral theory.³⁴ Experiments function as a method to confirm that Kant's philosophical conception systematizes and defends notions that are indeed not alien to ordinary rational agents, and that his philosophy has a basis in how agents deliberate about morally relevant matters.

The chemical decomposition and recombination that we find in the Second Critique's *Analytic* is located in Remarks, which make up the bulk of the first twenty pages of the *Analytic*. These Remarks explain and discuss the main text's Theorems and Problems. In so far as the experiments in the Remarks appear psychologically plausible to the reader they confirm Kant's distinction between pure and empirical determining grounds of the will, as well as his claim that the will has a rational affinity to pure determining grounds, and that these determining grounds therefore come with an unconditional normative force.³⁵ These are some of Kant's main assumptions regarding morality and agency.

Experiments do not introduce new distinctions or concepts. They show or confirm that Kant's complex conceptual operations in the *Analytic* of the Second Critique start from and never lose contact with everyday moral evaluations. This methodological approach is already foreshadowed in a dense footnote in the Second Critique's Preface (V:8) in which Kant stresses that his goal is not to invent a new *principle* of the good, but merely to find a new *formula* for a pre-existing notion of the morally good.

We will now look at the decomposition (4.1) and recombination (4.2) described in the *Analytic*'s Remarks.

4.1 The decomposition of common human reason

Kant begins the *Analytic* in §1 with an analysis of practical principles. There are two different

kinds of practical principles: maxims and practical laws. The former are only regarded as valid by the agent who adopted them, whereas the latter are valid for the will of every rational being (V:19.7-12). Maxims and practical laws are distinguished by the determining grounds they incorporate into a will (V:21.14-5). The distinction between determining grounds introduced in §1 corresponds to the distinction between the different determining grounds in an empirically affected will of an agent who recognises the moral law in P1. The *Analytic's* distinction is, however, a conceptual one and not the result of a chemical decomposition of examples of reason judging morally. In the Remark to §1, Kant seemingly expresses doubt that practical laws exist, since they exist only under the assumption that there is a pure determining ground of the will. In order to confirm that practical laws exist, Kant suggests analysing the “pathological affected will of a rational being” (V:19.17), i.e., a will which resembles the one of the honest but tempted agent in P1. In this will we can find coexisting an empirical determining ground, namely, the maxim “to let no insult pass unavenged” (V:19.20-1)³⁶, as well as a pure determining ground.

The aim of Kant's analysis in the §1 Remark is to show that if we analyze how an ordinary rational agent goes about deliberating what she ought to do, we will find two very different kinds of determining grounds of her will. That they are different *kinds* of determining grounds is shown by the introspectively observable fact that they can be in “conflict” (V:19.18) with each other. Kant assumes that conflicts between determining grounds of the will require different kinds of determining grounds. One of these determining grounds is empirical, since the agent has adopted non-universalisable maxims, such as to let no insult pass unavenged. This implies that the other kind of determining ground is not empirical but something else. That we can easily construct a plausible scenario of a conflict in an agent's will confirms Kant's conceptual distinction between pure and empirical determining grounds as well as his assumption that there are pure determining grounds of the will.

Kant's analysis rests on a number of problematic assumptions. Firstly, he assumes that pure and empirical exhaust the possible classes of determining grounds and that a non-empirical determining ground hence is a pure one. Secondly, he assumes that different empirical determining grounds cannot be in a genuine conflict with each other. Only empirical and pure determining grounds can be in a real conflict. The reason behind this is presumably either that there is only one empirical determining ground, namely happiness, which encompasses the whole of an agent's inclinations and desires (see V:25.24-27), or that if there is more than one empirical determining ground, the stronger trumps the weaker without a genuine conflict (see my sec.4.2). I will simply grant Kant his assumptions.

In §1, the decomposition is supposed to confirm the *problem* Kant poses, namely that the will of finite rational agents can be determined by different kinds of determining grounds. Can the chemical method also give a hint as to what "affinities" the will of such an agent has?

4.2 Recombination of determining grounds

In the sections following §1, Kant discusses the two different kinds of determining grounds of the will in isolation from each other. The recombination of the isolated components is described in an example discussed in the Remark to §6. This again is an example of a pathologically affected will judging about morally significant matters.

In the Remark, Kant discusses two thought experiments, which are supposed to show that even "experience confirms" (V:30.21) the epistemic priority of the moral law over freedom:

"But experience also confirms this order of concepts in us. Suppose someone asserts of his lustful inclination that, when the desired object and the opportunity are present, it is quite irresistible to him; ask him whether, if a gallows were erected in front of the house where he finds this opportunity and he would be hanged on it immediately after gratifying his lust, he would not then control his inclination. One need not conjecture very long what he would reply. But ask him whether, if his prince demanded, on pain of the same immediate execution, that he give false

testimony against an honorable man whom the prince would like to destroy under a plausible pretext, he would consider it possible to overcome his love of life, however great it may be. He would perhaps not venture to assert whether he would do it or not, but he must admit without hesitation that it would be possible for him. He judges, therefore, that he can do something because he is aware that he ought to do it and cognizes freedom within him, which, without the moral law, would have remained unknown to him.” (V:30.21-35)

The first thought experiment deals with an empirical determining ground only. The empirical determining ground is simply measured in strength, and motivational force springing from this determining ground can be outweighed by stronger motivations springing from the same determining ground. An agent can easily change his mind if the expected pleasure-pain-balance of an intended action changes. Genuine conflict within an agent’s deliberation can only be explained when assuming different *kinds* of determining grounds (see also IV:420.5-8).

In the second thought experiment, Kant introduces a determining ground of a different kind, a pure determining ground. Whether or not an agent would succumb to the prince’s threat, the agent “will perhaps not venture to assert” (V:30.32). It is unclear even to the agent himself how he would *in fact* act in a situation that comes with the threat of real losses. He might be weak and prefer life over duty. It is clear to the agent, however, how he *ought* to resolve the conflict between the two determining grounds: He should decide against all of his inclinations and obey the moral law, and the agent will judge “without hesitation” (V:30.32) that it is *possible* to do so. His judgement reveals that he is aware that he can do something, because he is aware of what he ought to do in this situation. Kant is not interested in how an agent predicts that he would in fact act in the situation described, but interested in what an agent would “admit” (V:30.33) to the philosopher, when experiencing the special force of the moral law, or when moral considerations become salient to an agent in the face of adversities.³⁷

After inquiring into the determining grounds that figure in the deliberation of finite agents in §1-6, Kant arrives at the conclusion that a distinction between how agents will *de facto* act and how they ought to is necessary when recombining components and investigating their affinities: The second thought experiment shows that at least on the level of what an agent on reflection admits a will has stronger affinities to pure than to empirical determining grounds. Kant's idea is that if his reader can identify with the way the person in the second gallows scenario reacts, a deep and lasting affinity between the will and duty is confirmed; an affinity built into the nature of these things, as chemical affinities are built into chemical elements. In fact, Kant even suggests that the reader, if in doubt about the accuracy of how Kant describes the reaction of the person in the thought experiment, can present the case to a *third party* ("But ask *him...*", i.e., someone who is neither Kant nor his reader – V:30.27, my emphasis) and learn something from this third party's verdict.

This specifically third-personal element of the gallows experiment is reflected in Kant's claim that the Fact of Reason is

"undeniable. One need only analyse the judgement that people pass on the lawfulness of their actions in order to find that, whatever inclinations may say to the contrary, their reason, incorruptible and self-constrained, always holds the maxim of the will in an action up to the pure will" (V:32.2-7).

Kant assumes that it is *other people's* judgments ("their reason") that warrant the existence of the Fact. The Fact of Reason becomes undeniable when analyzing *judgments of people* [Menschen, plural]. The gallows case is the best example Kant presents of how we can get other people to judge such that the Fact of Reason becomes undeniable in the analysis of their judgments.³⁸

The main idea of Kant's Second Critique, the claim that pure practical reason can be practical on its own, is thus shown to be in line with Kant's general methodological assumption that

practical philosophy cannot be a radical revision of the way common people deliberate and judge. Experiments in ethics make explicit structures that govern moral reasoning, just as the experimental chemist makes explicit the fundamental laws that govern parts of nature so small that it takes the artificial setup of experiments to make these laws observable. The experiment Kant suggests in the Second Critique's §6 is supposed to confirm that no matter how much an agent is entangled in empirical determining grounds, insofar as she is rational she can recognize that pure determining grounds have authority over her. This reveals a significant difference between experiments in chemistry and in practical philosophy. The experiment in §6 does nothing to answer the question of how the agent who has to choose between life and obedience to the moral law *will* behave in fact. The answer to this question is simply contingent, and not the object of practical philosophy.

Experiments in chemistry and ethics both enquire into laws. Experiments in practical philosophy investigate the law of an agent's rational self in its relation to her sensuous nature. Rational laws come for a finite rational being as imperatives or unconditional oughts. Kant's ethical experiments emphasize the normativity of moral commands by making explicit the difference between how an agent is uncertain about how he *would* act in a real situation, and how he acknowledges that he *ought* to act. Making explicit the distinction between matters of fact and what ought to be is a specific feature of experiments in ethics as conducted on the will of finite rational agents, and has no equivalent in chemistry.

Conclusion

What have we gained from my discussion of experiments in Kant's ethics? The experiment as presented in P1 reveals that, according to Kant, the rational will and personal happiness start ethical deliberation in a solution with each other. An agent's desire for happiness is the natural starting point of ethical deliberation, and this desire only loses its rational support

(though not its affective force) when moral prohibitions become salient to an agent.

Furthermore, P1 reveals that Kant thought that it can take other agents (chemists in his analogy) to bring certain moral prohibitions to our attention. This also entails that the philosopher (the chemist) has to actively create scenarios and confront agents with these cases, if she wants to obtain confirmation of her theory. Our discussion of P2 revealed that Kant, in his Second Critique, was engaged both in philosophical investigation and in providing the moral educator with material and advice to work with, and that Kant saw a close continuity between ethical theory and moral education.

Most importantly, experiments are a strategy to trigger and investigate agent's judgements about hypothetical scenarios of moral significance. The decomposition is supposed to reveal what ordinary judgements presuppose. Kant believes that agents even without any philosophical background when presented with the right scenario will confirm that the Second Critique's Analytic deals with a problem that they can find in their moral deliberation, namely, that there are different kinds of determining grounds. The recombination is supposed to show which determining ground is accorded normative authority. If agents can identify with the person in the gallows case, or in other scenarios of agents abstracting from their inclinations in cases of conflict with morality, they confirm Kant's central assumption that the will of rational agents has an affinity to the pure determining ground and that rational agents believe that they can do something because they ought to. They confirm that Kant's assumption is not a perplexing notion of academic theory but the central element of what rational agents independently of moral theory take the status of morality to be.

To close on a critical note: At least one important question remains unanswered by my discussion. Experiments are commonly seen as an impure element of scientific theory or one that requires room for empirical knowledge – after all, this is the kind of knowledge that

experiments usually afford.³⁹ It is clear that the ethical thought experiment does not deliver straightforwardly empirical knowledge about the mere behaviour of agents. Ethical experiments enquiry into reflected and considered responses to morally relevant cases and they are hence not empirical in the sense that facts about brain functions, psychology, or even human nature might be. Yet, there is a worry that experiments as recommended for the ethicist make Kant's ethical theory, or at least its confirmation, dependent on knowledge about contingent subject-matters. Whether or not this is a problem Kant can deal with depends on how to best spell out his notion of purity and whether this notion allows for normative input from other agents for the philosopher's theorizing.

¹ Owen Ware, "Rethinking Kant's Fact of Reason," *Philosopher's Imprint* 14 (2014): 1-21

² To my knowledge only Valerio Rohden, "An Experiment with Practical Reason," in *Kant in Brazil*, ed. Frederick Rauscher et al. (Rochester: University of Rochester Press, 2012), 98-109 is a paper-length treatment of the first of these two passages. The main contribution of Rohden's paper is to argue for an emendation of the *Academy Edition* text. I accept this emendation (see my sec.2.1). Very recently, Ware "Rethinking Kant's Fact of Reason" has discussed the chemistry passages in connection to the Fact of Reason. Ware's paper is of great merit for our understanding of the Fact of Reason, but does not offer a detailed analysis of the two chemistry passages based on Kant's conception of chemistry and of the structural role of decomposition and recombination in the *Analytic* of the Second Critique – tasks which I will undertake in this paper.

³ See Karl Ameriks, "Kant on Science and Common Knowledge," in *Kant and the Sciences*, ed. Eric Watkins (Oxford, New York: OUP, 2011), 31-53 for an approach that stresses the role of natural science, particularly of physics, for Kant's entire transcendental philosophy. Furthermore, Timothy Rosenkoetter, "Kant on Construction, Apriority, and the Moral Relevance of Universalization," *British Journal for the History of Philosophy* 19 (2011): 1143-74 argues that analogies exist between mathematics and Kant's notion of universalization.

⁴ There has been interest in the role of common rational cognition of duty for the Categorical Imperative (Ido Geiger, "What it is the Use of the Universal Law Formula of the Categorical Imperative?," *British Journal for the History of Philosophy* 18 (2010): 271-95), [removed for blind review], Kant's engagement with scepticism (Paul Guyer, "Kant on Common Sense and Scepticism," *Kantian Review* 7 (2003): 1-38), and naturalism (Jennifer Uleman, *An Introduction to Kant's Moral Philosophy* (Cambridge: CUP, 2010), as well as for Kant's entire critical philosophy (see Karl Ameriks, *Kant and the Fate of Autonomy: Problems in the Appropriation of the Critical Philosophy* (Cambridge: CUP, 2000), Karl Ameriks, *Kant's Elliptical Path* (Oxford: OUP, 2012)). The most extensive discussion of the common perspective in Kant's practical philosophy to date is Jeanine Grenberg, *Kant's Defense of Common Moral Experience: A Phenomenological Account* (Cambridge: CUP, 2013).

⁵ Kant's Works are quoted volume:page.line of the *Academy Edition*. The first Critique is quoted according to the A and B edition. Translations follow Mary J. Gregor, trans., *Practical Philosophy* (Cambridge: CUP, 1996), Paul Guyer, Allan Wood, trans., *Critique of Pure Reason* (Cambridge: CUP, 1998), Michael Friedman, trans., *Immanuel Kant: Metaphysical Foundations of Natural Science* (Cambridge, CUP, 2004), Jens Timmermann, trans., *Groundwork of the Metaphysics of Morals* (Cambridge: CUP, 2011). I have made occasional changes to these translations, some of which I will discuss below. Previously untranslated passages are my own translation.

⁶ Kant also makes use of chemical terminology in order to explain the relation between revelation and reason in the preface to the second edition of the *Religion* (VI:12.6-13.11). I cannot investigate this aspect of chemistry here. See instead Ameriks *Kant's Elliptical Path*, 283-4. See Pierre Kerszberg, "Entre science et speculation: Kant et le chimie," in *Kant und die Berliner Aufklärung. Akten des IX. Internationalen Kant-Kongresses*, ed. Volker Gerhardt et. al. (Berlin, New York: De Gruyter, 2001), vol.4, 572-81 for discussion of chemical

metaphors in the First and Third Critique, and Alberto Vanzo, “Kant on Experiment,” in *Rationis Defensor: Essays in Honour of Colin Cheyne*, ed. James MacLaurin (Dordrecht: Springer, 2012), 75-96 for the role of the scientific experiment in Kant’s philosophy in general.

⁷ Kant’s conception of education has lately become a topic of great interest. See Kristi Sweet, “Philosophy and the Public Sphere: Kant on Moral Education and Political Critique,” *Idealistic Studies* 41 (2011): 83-94, Felicitas Munzel, *Kant’s conception of pedagogy: Toward education for freedom* (Evanston: Northwestern University Press, 2012), Klas Roth, Chris Surprenant, *Kant and Education: Interpretations and Commentary* (New York: Routledge, 2012), [removed for blind review].

⁸ See for instance Michel Chaouli, *The Laboratory of Poetry: Chemistry and Poetics in the Work of Friedrich Schlegel* (Baltimore and London: The John Hopkins University Press, 2002).

⁹ Michael Friedman, *Kant and the Exact Sciences* (Cambridge, Mass.: Harvard University Press, 1992), xi.

¹⁰ Passages in which Kant discusses philosophical or scientific aspects of chemistry are A/B:646/674, 652-3/680-1, V:349.20-350.2, VIII:322.2-323.21, IX:223.27-37, 251.9-33, 253.28-34, 365.5-30, XXIX:97.1-99.32, 161-169.

¹¹ An extensive treatment of the status of chemistry as a scientific discipline can be found in Bernadette Bensauade-Vincent, Jonathan Simon, *Chemistry: The Impure Science* (London: Imperial College Press, 2008).

¹² This model of chemical enquiry is consistent with the 18th century use of the German terms “Chemie” and “Chymie” (see Johann C. Adelung, *Grammatisch-kritisches Wörterbuch der hochdeutschen Mundart* (Wien: Bauer, 1811), vol.1, col.1335-6). Kant’s term “decomposition” [Scheidung], which he uses for the first step of the chemical experiment, is early modern chemical terminology (Jacob Grimm, Wilhelm Grimm, *Deutsches Wörterbuch von Jacob Grimm und Wilhelm Grimm* (Trier: Kompetenzzentrum für elektronische Erschließungs- und Publikationsverfahren in den Geisteswissenschaften, 2016), vol.14, col.2418-9). Furthermore, “Scheidekünstler” was a common term for chemists (Grimm vol.14, col.2400). See also Michael McNulty, “Kant on Chemistry and the Application of Mathematics in Natural Science,” *Kantian Review* 19 (2014): 407: “according to Kant chemistry is the science of dissolving and decomposing forces; the chemist is to discover laws governing such forces”.

¹³ See IV:530.8-534.10, XXIV:470.2-7, 481.2-13 as well as Konstantin Pollok’s, *Kants „Metaphysische Anfangsgründe der Naturwissenschaft“: Ein kritischer Kommentar* (Hamburg: Meiner, 2001), 370-2, and Michael Friedman’s, *Kant’s Construction of Nature: A Reading of the Metaphysical Foundations of Natural Science* (Cambridge: CUP, 2013), sec.20 commentaries for more on Kant’s conception of chemistry in the *Metaphysical Principles* (IV:530.8-532.19).

¹⁴ Martin Carrier, “Kant’s Theory of Matter and His Views on Chemistry,” in *Kant and the Sciences*, sec.7 reminds us that these components or elements are for Kant not something empirical but regulative ideas of reason (see B:673-4, XXIX:161-3). This clearly resonates in the ethical experiment in which determining grounds and the will are not something empirical but principles (see also A/B:652-3/680-1).

¹⁵ There is an alternative reading of this footnote, which does not neatly accord with my conception of the chemical method: The philosopher decomposes pure cognition, analyses the elements in isolation, and recombines them again with each other, but not with a third substance (see also B:xii-xiii). This recombination is supposed to confirm that the elements did not become impure in the course of the experiment (see Ursula Klein, Wolfgang Lefèvre, *Materials in Eighteenth-Century Science: A Historical Ontology* (Cambridge, MA.: MIT Press, 2007), 115-8). Even if the First Critique footnote leaves unclear whether the chemical experiment involves a third substance, P1 shows that Kant believes that a third substance needs to be added at least in the case of ethics.

¹⁶ See Carrier “Kant’s Theory of Matter”, sec.1, Friedman *Kant’s Construction of Nature*, 240-58 for detailed discussion of the relation between Newton and chemistry. According to Pollok *Kants „Metaphysische Anfangsgründe der Naturwissenschaft“*, 350, the fact that, for Kant, chemistry deals with “specific differences” of substances, i.e., their qualities, is the reason why chemistry cannot be a priori.

¹⁷ The first of these lists was by Geoffroy in 1718. See Klein, Lefèvre *Materials in Eighteenth-Century Science*, 56-58, Martin Carrier, “Die begriffliche Entwicklung der Affinitätstheorie im 18. Jahrhundert: Newtons Traum – und was daraus wurde,” *Archive for History of Exact Sciences* 36 (1986), sec.1 for the historical background of the theory of affinities. See Friedman *Kant and the Exact Sciences*, 268-279 for an overview of the chemical state of the art of the late 18th century.

¹⁸ The connection between affinities and chemical laws is acknowledged by Kant in V:349.26, VIII:322.2-323.4.

¹⁹ That chemical affinities can only be investigated by means of experiment is clearly stated in IV:534.18-20. See also XXIII:284.14-9 for the significance Kant accords to elective affinities.

²⁰ Gregor *Practical Philosophy*, 214.

²¹ In VI:129.35-8, Kant claims that “Kalkerde” is what the human body, devoid of soul or reason, is made of. Calcareous earth for Kant is on the sensuous side of things and yet an essential part of finite rational agents.

²² Jens Timmermann, *Sittengesetz und Freiheit: Untersuchung zu Immanuel Kants Theorie des freien Willens* (Berlin, New York: de Gruyter, 2003), 106n.2, Jens Timmermann, “Good but Not Required? – Assessing the Demands of Kantian Ethics,” *Journal of Moral Philosophy* 2 (2005): 9-27. Valerio Rohden, “Die handschriftlichen Korrekturen im Erlanger Original exemplar der *Kritik der praktischen Vernunft*,” *Kant-Studien* 90 (2004): 135-45, Rohden “An Experiment with Practical Reason”, 105.

²³ Gregor’s translation (in *Practical Philosophy*, 214) avoids the issue entirely by not translating the “nur/nun”.

²⁴ See IV:454.20-455.9, V:443.14-28, VI:182.4-5, 480.14-482.29 as examples for such a dialogical engagement.

²⁵ Thomas E. Wartenberg, “Reason and the practice of science,” in *The Cambridge Companion to Kant*, ed. Paul Guyer (Cambridge: CUP, 1992), 243 fittingly characterizes experiments as a “specific goal-directed activity that takes place in the light of ideas – that is concepts that are not themselves generated by experience”. That the requirement to pose questions to nature *actively* is the salient aspect of scientific method for Kant is especially apparent in B:xiii. Kant, however, is also aware that the decomposition can happen without any artificial setup (see V:89.5-8).

²⁶ This effect is not necessarily reflected in *actions*. As an example see the *Groundwork*’s most hardened scoundrel who after he becomes aware of his good will does “wish that he too might be so disposed” and yet only recognizes the repute of the moral law “as he transgresses it” (IV:454.20-454.9), i.e., as a feeling of guilt.

²⁷ Grenberg *Kant’s Defense of Common Moral Experience*, 26 stresses that Kant’s description of the ethical experiment shows that the practical philosopher is not supposed to introduce anything new to common moral experience, but simply to analyze it carefully. I agree with Grenberg that this is what the experiment *should* show, but the reference to chemistry is misleading here, since the chemist, unlike the ethicist, *does* introduce a new substance in order to facilitate a reaction. Ware “Rethinking Kant’s Fact of Reason”, 12 is likewise oblivious of the important difference between the chemist and the philosopher when he reads P1 as advocating an “adding [of] a pure determining ground” as opposed to bringing out something that is already present.

²⁸ “Eben so haltet dem, der sonst ein ehrlicher Mann ist [...] das moralische Gesetz vor”. The Gregor translation (*Practical Philosophy*, 214) ignores the imperative in this sentence, just as other translations of the Second Critique that I have consulted do.

²⁹ Kant is here presumably mimicking the way chemical textbooks instruct experimenters in the second person singular (see Klein, Lefèvre *Materials in Eighteenth-Century Science*, 29).

³⁰ Ware “Rethinking Kant’s Fact of Reason”, 14 has recently emphasized with regard to examples in the Second Critique’s *Doctrine of Method* (esp. V:155-6) that “the philosopher’s experiment is also a method of moral education”.

³¹ I here partly disagree with Sweet’s “Philosophy and the Public Sphere” idea that, according to Kant, practical philosophy must serve to morally and politically improve the public sphere. I fully agree that philosophy should do this, but I also believe that it is not the philosopher who is directly called upon to disseminate moral insights amongst the general public, as Sweet believes (see *ibid.* 86-8).

³² See IV:411.8-412.14, V:157.28-33, IX:493.35-494.4, 451.12-3, XXV:653.12-27.

³³ Kant’s remarks on how philosophy can be applied to moral *education* are located in the *Doctrine of Methods*. P2 is located *after* the *Doctrine of Method*. There is no direct reference to chemistry in Kant’s Second Critique treatment of moral education.

³⁴ See for instance IV:402.1-15, 454.20-455.9. Jens Timmermann, “Reversal or retreat? Kant’s deductions of freedom and morality,” in *Kant’s Critique of Practical Reason: A Critical Guide*, ed. Andrews Reath et. al. (Cambridge: CUP, 2010), 73-90 argues convincingly that Kant relies on common human reason in the Second Critique even more than he does in the *Groundwork*, which famously starts from “common moral rational cognition” (IV:393.3).

³⁵ Vanzo “Kant on Experiment”, sec.7.2.1 stresses that scientific experiments for Kant presuppose a theory or hypothesis which they are supposed to confirm. Ware “Rethinking Kant’s Fact of Reason” gives the ethical experiment a weaker reading than me, when he says that its function is to *illustrate*. As we saw in the previous section, illustration is something the experiment can do for the *educator and the pupil*. For the philosopher it can also confirm.

³⁶ It is unclear why Kant thinks that letting no insult pass unavenged is a non-universalizable maxim. Nothing in the ethical experiment, however, hinges on the specificity of this maxim.

³⁷ A similar example is already presented in the Deposit Case in §4 (see also VIII:286.8.287.21). Dieter Schönecker, “Kant’s Moral Intuitionism: The Fact of Reason and Moral Predispositions,” in *Kant Studies Online* (2013): 15-6, however, correctly points out that the Deposit Case, unlike the case in §6, only concerns the *principium diiudicationis*, not the *principium executionis* or the authority of duty.

³⁸ This is very much at odds with a recent trend to read Kant’s ethics, in particular the gallows case, as exhibiting a specific first-personal approach to ethics which abstracts from other agents’ judgments (see Grenberg *Kant’s Defense of Common Moral Experience* and Ware “Rethinking Kant’s Fact of Reason”). My reconstruction of the experimental method as involving other agents provides textual evidence against this

approach. A more detailed reading of the Fact of Reason and the gallows case than I can undertake here would further support my point.

³⁹ That this is also the case for Kant's notion of experiments is emphasized by Wartenberg "Reason and the practice of science", 244: Kant's notion of experiment "makes the validity of specific scientific theories dependent on actual experience".